Geoffrey Peckham is CEO and director of research and development at Clarion Safety Systems, a company that designs and manufactures safety signs and labels. In this interview, Peckham explains how safety signs and symbols will change in light of OSHA’s final rule to revise its hazard communication standard and discusses the importance of semiotics in the workplace.

**MPS:** Please provide a brief description of your professional background and of your position as CEO of Clarion Safety Systems, LLC.

**GP:** I started Clarion 22 years ago to provide companies with warnings, primarily on-product warnings for capital equipment, so that people who transport, install, use, service and decommission equipment could be better protected from harm.

Prior to forming Clarion, it was my time spent studying art and philosophy at Cambridge and Oxford Universities that gave me an intense interest in visual communication. I put myself through college by working in the printing/ graphic reproduction industry, in both the production and management sides of the business. So it is with all of these things combined that brought Clarion, and me personally, to where we are today.

**MPS:** OSHA has issued a final rule to revise its hazard communication standard (HCS) (29 CFR 1910.1200) to align with the United Nations’ (UN) Globally Harmonized System of Classification and Labeling of Chemicals (GHS). Why is this global consistency so important when it comes to safety signs, symbols and markings?

**GP:** Global consistency is important to safety communications for the simple reason that we live in an increasingly interconnected world. Our economies are inextricably linked. Many companies are global in scale; the markets for their products and/or their workforces and facilities extend beyond the borders of one country. Safety communication is only effective if it can convey the intended message to the intended audience. So whether your intended audience is the general public, your local employees or an international workforce, the methods you use to convey safety information should now be designed in a manner that is consistent with global standards, not provincial national standards.

The UN certainly understood this principle when it began the development of GHS. Although it has taken years to complete, OSHA’s recent adoption of GHS is, in my opinion, a brilliant move. Not only does it signal to the world that the U.S. is on board with the idea that safety matters, but it also begins the process of accepting internationally standardized graphical symbols as the means to improve the communication of critically important safety information.

**MPS:** In light of OSHA’s final rule, how is Clarion advising its clients when it comes to indicating chemical hazards on product safety labels or facility safety signs?

**GP:** GHS was meant to provide chemical manufacturers with a fixed set of pictograms and word messages to be used on safety labels that would appear on their chemical products’ packaging. But our recommendation to our clients is this: Anytime you need to sign or label to warn about a chemical hazard, whether it is on a facility safety sign or on an equipment safety label, use one of the nine pictograms that are part of GHS if it applies to what you are trying to communicate.

A good example of the usefulness of GHS pictograms is the new construction-oriented safety sign we created for a company that does demolition and renovation. The sign warns about asbestos (Figure 1). First, notice that our sign’s message is not a simple, generic “DANGER—Asbestos,” as shown in Figure 2. Instead, the content of the new sign is more detailed. This is becoming the norm, not the exception. In almost every situation we encounter when we are designing safety signs that are compliant with the latest standards, the messaging is much more specific so the viewer can better understand and avoid the potential hazard. The new sign, then, goes one step further. To reinforce the word message, symbols were added. And not just any symbols. Since the inhalation of asbestos fibers was the problem, the GHS symbol for “Health Hazard” was perfect for the job of pictorializing the hazard. The “No Access for Unauthorized Persons” symbol was then added to pictorialize the primary avoidance message.

Using the GHS symbols on your facility signs and equipment safety labeling will help reinforce the understanding of the pictograms.
wherever they are used. When it comes to establishing a symbol-based system for globally recognizing hazards, part of the equation is training people on the symbols’ meaning. Using these GHS pictograms when you need to communicate chemical hazards will help achieve the goal of global comprehension for these symbols.

**MPS:** You mentioned that GHS is just the beginning of a new way to better communicate safety. What did you mean by this?

**GP:** OSHA’s acceptance of GHS was the start of a process that recognizes the fact that the latest standards having to do with safety signs and labels give safety professionals a valuable tool to better communicate risk and reduce it. You need only compare one of the old-style signs you typically find in U.S. workplaces today with one of the new ANSI/ISO standards-based signs to see and understand the difference.

Seeing—that is the first objective of every safety sign, that it be seen! The old 1941-era ASA Z35.1 signs you might still be purchasing for your facility today are not only outdated in terms of their formats and oversimplified content, but they lack symbols. All three of these components not only better convey a sign’s message across language barriers, but help the sign achieve its first goal, that of being noticed.

Truly, a picture is worth a thousand words here. Although in the case of safety signs, the picture is worth more than words—it can be worth a person’s life. The graphics used on safety signs play an integral role in getting your message across. The fact is the old word-message-only signs are rapidly going by the wayside and in their place are new signs that use the new symbol-based communication technology. We see this here in the U.S. and in nearly every country in the world where safety communication is valued.

**MPS:** What is semiotics and how does it relate to safety signs and symbols?

**GP:** Semiotics is the science behind how signs and symbols communicate messages. The field of semiotics was invented by Charles Pierce in the early 1900s. Although he died in relative obscurity, Pierce is now recognized as having been one of America’s greatest thinkers. Ironically, Pierce lived and worked out of his home located half a mile down the road from Clarion’s world headquarters in Milford, PA.

If I were to condense semiotics down to a few words, it works like this. In the material world, everything we perceive as communication is made known to us through our senses—sight, touch, hearing, etc. In the visual realm, we see colors and shapes and these things have meaning to them. The words you are reading right now are made up of letters, each of which has a shape that, when put in context with other letters, make up words that have meanings. But the vehicle of transmitting these meanings starts with seeing them and associating what you see with a meaning, a meaning that has been learned. At Clarion, we apply this theory of knowledge communication to the field of safety signs and labels. Colors, shapes, symbols and words become signal colors, safety symbols and coherent text messages all aimed at reducing risk and protecting people. It is fascinating work.

**MPS:** Can you provide some examples of where semiotics proved successful in the workplace?

**GP:** First, many people doubt the effectiveness of warnings and say that you can never prove whether or not a safety sign has done its job of preventing accidents. I challenge this assumption with this fact: At this point in time, Clarion has more than 46 million safety signs and labels installed in over 180 industries, and we have yet to hear of a single instance where one of our clients was sued for “inadequate warnings” or “failure to warn.” Since these are the
two leading allegations in product liability lawsuits today in the U.S., and these allegations are increasingly found in premises liability litigation, the fact that we are using semiotics to successfully communicate safety speaks for itself.

To illustrate this point, compare the signs shown in Figure 3. The signs on the left served as the starting point for deviation to create new signs on the right that are, first and foremost, compliant with the latest ANSI Z535 standards (the standards that set the benchmark for safety signs, colors, labels, tags, symbols and safety information in manuals in the U.S.). Second, the new signs not only describe the hazard, but they include information on the possible consequences of interaction with the hazard and how to avoid the hazard. This increased degree of content is in line with the expectations our society has today for knowledge and information, especially when it comes to safety.

Over the years, U.S. court cases have defined and redefined what constitutes an “adequate warning,” and it is on this understanding, combined with human factors research, that the ANSI Z535 standards were built. At Clarion, we infuse our safety sign design experience and knowledge into each sign we design. The standards and the experience in having applied the standards to address so many needs make the signs on the right more effective than those on the left. The communication that is possible with the new sign systems is light years beyond where it used to be.

MPS: Is semiotics often used in settings where workers speak multiple languages?

GP: Yes. The new sign systems we are designing for multilingual workplaces incorporate standards-based color-coding and symbols, as well as text messages that are often translated into the various languages spoken in the specific facility. By using the latest digital print production technology, we are able to cost-effectively produce these sign systems, tailoring them to the specific needs of every client. Old generic signage was practical back in its day because customized signs were prohibitively difficult and costly to make. That has all changed thanks to digital imaging and today’s high-tech materials that do not compromise quality and longevity. Safety professionals need to know these tools exist and that they can be used effectively to reinforce their safety training programs. It is possible, now, to achieve the goal of improved safety communication precisely because all of the tools and motivators have come together—the standards, graphical symbols, global consistency, safety training reinforcement and digital print production technology.

MPS: You are the new chair of the ANSI Z535 standards committee, which writes standards that govern the characteristics of visual safety markings used to warn about hazards and prevent accidents. How do you think the ANSI Z535 standards will be further developed or revised from this point forward, and how do these standards mesh with OSHA’s current regulations?

GP: As with all ANSI standards, the Z535 series is on a 5-year revision cycle, which means the 2011 standards will be revised and published again in 2016. It is a great committee. I have been on it now for 20 years, and unlike many standards committees where everyone comes from the same industry, the Z535 members come from a diverse range of industries, backgrounds and expertise.

For instance, just the manufacturers on the committee make the following products: heavy off-road equipment, hand power tools, consumer products, batteries, firearms, home appliances, furniture and industrial machinery, to name a few. Add to that people from the insurance industry, the legal profession, the Consumer Product Safety Commission and human factors experts and you have a wide range of perspectives on how warnings are designed and used in real life.

What works and what does not work in the ANSI Z535 standards has been sorted out over the years. Now new issues present themselves that will cause these standards to be further refined. It is clear that graphical symbols are playing an increasingly important role on safety signs, labels and tags. The ANSI Z535.3 standard, Criteria for Safety Symbols, will probably change considerably in its next version. Right now, the standard gives some general guidance on symbol design and describes how to test symbols for comprehension. I can see the Z535.3 standard giving more practical advice on how and where to use symbols, with many examples of illustrative techniques. This would be done in an informative annex so the examples would not be misinterpreted as the only way to do things. They would just be
examples of how to apply some of the design concepts described in the standard. Such changes would make the standard more useful to those who design warnings and would help keep it relevant in a world becoming increasingly dependent on symbols.

As for the relationship between the ANSI Z535 standards and OSHA regulations, I will paraphrase David Michaels, assistant secretary of labor, as he spoke at ASSE’s Safety 2012: “If you are looking to implement best practices, do not turn to OSHA’s regulations, they are out of date… look to ANSI standards, they represent the current state of the art.”

In so many areas, OSHA regulations have not been revised since their initial creation, and the references to safety sign, color and tag standards that OSHA makes are to the 1967 versions of what are now the ANSI Z535 series of standards. OSHA accepts compliance with the Z535 standards through the “de minimus” rule that allows one to use the latest version of the basis document that OSHA used to make its regulations. It is not a pretty way of doing things, but short of OSHA overcoming its own politically charged process of rulemaking; it is the best way to justify doing the right thing.

MPS: How does your experience as CEO of Clarion help you in your position as ANSI Z535 chair?

GP: My role at Clarion involves working directly with clients to develop safety sign systems for their products, factories and environments. It is the experience of having practically implemented the concepts found in the ANSI Z535 standards that I bring to the standards-making table. Over the past several revision cycles, many of my change proposals have been accepted by the committee and written into the standards, and every one of these changes began as a means to better meet a client’s need to communicate safety. As chair of the committee, I hope to continue to see that future revisions to the standards are valuable to those who need to implement them, all in the effort to keep people from harm. This goal of protecting people is a worthwhile endeavor and one that every safety professional recognizes as vitally important. I take great satisfaction in working with these people to create better and safer work environments for their companies to thrive in.

Geoffrey Peckham is a longtime member of ASSE and CEO and director of research and development at Clarion Safety Systems. He is chair of both the ANSI Z535 Committee and the U.S. Technical Advisory Group to ISO Technical Committee 145—Graphical Symbols. Over the past two decades, he has played a role in the harmonization of U.S. and international standards pertaining to safety signs, colors, formats and symbols.

Figure 3 Comparing Old to New

OLD

DANGER
HIGH VOLTAGE

CAUTION
DO NOT OPERATE WITHOUT GUARDS

DANGER
CONFINED SPACE

NEW

DANGER
High voltage. Electrocution hazard. Lockout/tagout before servicing.

WARNING
Moving parts can crush and cut. Do not operate with guard removed. Follow lockout procedure before servicing.

DANGER
ASPHYXIATION HAZARD
Permit-required confined space. Contaminated air. Breathing air respiratory protection required.

(Best practice signs ©Clarion Safety Systems)